WHAT IS CLAIMED IS:

1. A diesel fuel composition comprising a major amount of a hydrocarbon fuel boiling in the middle distillate boiling range, and a minor amount of a nitrate-containing cetane improver, wherein the composition is essentially free of one or more heteroatomic compounds selected from pyrroles, indoles, sulfides, disulfides, mercaptans, thioacids, sulfonic acids, and/or indolines.

2. The fuel composition of claim 1, wherein the composition is essentially free of pyrroles, indoles, sulfides, disulfides, mercaptans, thioacids, sulfonic acids, and indolines.

3. The fuel composition of claim 1, wherein the composition is free of pyrroles, indoles, sulfides, disulfides, mercaptans, thioacids, sulfonic acids, and indolines.

4. The diesel fuel composition of claim 1, wherein the nitrate-containing cetane improver is present in an amount of from about 100 to about 10,000 ppm, and the heteroatomic compounds, if present, are present at a level of less than 2 ppm total heteroatomic content.

5. The composition of claim 1, wherein the nitrate-containing cetane improver is selected from methyl nitrate, ethyl nitrate, propyl nitrate, isopropyl nitrate, allyl nitrate, butyl nitrate, isobutyl nitrate, *sec*-butyl nitrate, *tert*-butyl nitrate, amyl nitrate, isoamyl nitrate, 2-amyl nitrate, 3-amyl nitrate, *n*-pentyl nitrate, hexyl nitrate, heptyl nitrate, 2-heptyl nitrate, octyl nitrate, isooctyl nitrate, 2-ethylhexyl nitrate, nonyl nitrate, decyl nitrate, undecyl nitrate, dodecyl nitrate, cyclopentyl nitrate, cyclohexyl nitrate, methylcyclohexyl nitrate,

cyclododecyl nitrate, 2-ethoxyethyl nitrate, 2-(2-ethoxyethoxy)ethyl nitrate, tetrahydrofuranyl nitrate, tetraethyleneglycol dinitrate, isomers thereof, and mixtures thereof.

6. The composition of claim 1, wherein the nitrate-containing cetane improver is 2-ethyl hexyl nitrate.

7. The fuel composition of claim 1, wherein the nitrate-containing cetane improver is 2-ethylhexyl nitrate and the composition is essentially free of pyrroles.

8. The fuel composition of claim 1, wherein the nitrate-containing cetane improver is 2-ethylhexyl nitrate, and the composition is essentially free of indoles.

9. The fuel composition of claim 1, wherein the nitrate-containing cetane improver is 2-ethylhexyl nitrate, and the composition is essentially free of sulfides.

10. The fuel composition of claim 1, wherein the nitrate-containing cetane improver is 2-ethylhexyl nitrate, and the composition is essentially free of disulfides.

11. The fuel composition of claim 1, wherein the nitrate-containing cetane improver is 2-ethylhexyl nitrate, and the composition is essentially free of mercaptans.

12. The fuel composition of claim 1, wherein the nitrate-containing cetane improver is 2-ethylhexyl nitrate, and the composition is essentially free of thioacids.

13. The fuel composition of claim 1, wherein the nitrate-containing cetane improver is 2-ethylhexyl nitrate, and the composition is essentially free of sulfonic acids.

14. The fuel composition of claim 1, wherein the nitrate-containing cetane improver is 2-ethylhexyl nitrate and the composition is essentially free of indolines.

15. A method of reducing the amount of discoloration which occurs in diesel fuel containing a major amount of a hydrocarbon fuel boiling in the middle distillate boiling range, and a minor amount of a nitrate-containing cetane improver, said method comprising removing from said diesel fuel essentially all of the pyrroles, indoles, sulfides, disulfides, mercaptans, thioacids, sulfonic acids, and indolines.

16. A method of reducing the amount of discoloration which occurs in diesel fuel containing a major amount of a hydrocarbon fuel boiling in the middle distillate boiling range, and a minor amount of a nitrate-containing cetane improver, said method comprising removing from said diesel fuel all of the pyrroles, indoles, sulfides, disulfides, mercaptans, thioacids, sulfonic acids, and indolines.

17. A method of reducing the amount of sedimentation which occurs in diesel fuel containing a major amount of a hydrocarbon fuel boiling in the middle distillate boiling range, and a minor amount of a nitrate-containing cetane improver, said method comprising removing from said diesel fuel essentially all of the pyrroles, indoles, sulfides, disulfides, mercaptans, thioacids, sulfonic acids, and indolines.

18. A method of reducing the amount of sedimentation which occurs in diesel fuel

containing a major amount of a hydrocarbon fuel boiling in the middle distillate boiling range, and a minor amount of a nitrate-containing cetane improver, said method comprising removing from said diesel fuel all of the pyrroles, indoles, sulfides, disulfides, mercaptans, thioacids, sulfonic acids, and indolines.

19. A low sulfur D-2 (ASTM D975) diesel fuel having the following properties:

Cetane number	ASTM D613	35 to 60
Cetane index	ASTM 4737	<60
Aromatics, total, wt. %	ASTM D5186	<40
Polynuclear aromatics, wt. %,	ASTM D2425	<11
Sulfur, ppmw,	ASTM D2622-1	<50
Nitrogen, ppmw	ASTM D4629	<1000, and

A total amount of nitrogen and sulfur from pyrroles, indoles, sulfides, disulfides, mercaptans, thioacids, sulfonic acids, and indolines of no more than 5 ppm.

20. The fuel of claim 19, wherein the amount of each of the heteroatomic compounds pyrroles, indoles, sulfides, disulfides, mercaptans, thioacids, sulfonic acids, and indolines is no more than 5 ppm.

21. The fuel of claim 19, wherein the amount of pyrroles, indoles, sulfides, disulfides, mercaptans, thioacids, sulfonic acids, and indolines is no more than 5 ppm.

22. A diesel fuel meeting the requirements of ASTM D 975 for a low sulfur No. 2-D

diesel and providing emission benefits at least equivalent to a diesel fuel as per Section 2282(g), Title 13, California Code of Regulations, said fuel containing from about 10 vol. % to about 30 vol. % aromatics and having a Cetane number of at least 40 but less than 60; a nitrogen content of no greater than 1000 ppmw; a sulfur content of no greater than 50 ppmw; and a total amount of nitrogen and sulfur from pyrroles, indoles, sulfides, disulfides, mercaptans, thioacids, sulfonic acids and/or indolines of no more than 5 ppm.

23. A diesel fuel composition comprising:

a major amount of a hydrocarbon boiling in the middle distillate boiling range;

2-ethyl hexyl nitrate cetane improver present in an amount of from about 100 to about 10,000 ppm; and

wherein the total amount of nitrogen and sulfur present in the fuel from pyrroles, indoles, sulfides, disulfides, mercaptans, thioacids, sulfonic acids and/or indolines is no more than 5 ppm.

24. The diesel fuel composition of claim 23, wherein the total amount of nitrogen and sulfur present in the fuel from pyrroles, indoles, sulfides, disulfides, mercaptans, thioacids, sulfonic acids and/or indolines is no more than 2 ppm.

25. The diesel fuel composition of claim 23, wherein the amount of each of pyrroles, indoles, sulfides, disulfides, mercaptans, thioacids, sulfonic acids and/or indolines is no more than 5 ppm.

26. The diesel fuel composition of claim 23, wherein the amount of each of pyrroles, indoles, sulfides, disulfides, mercaptans, thioacids, sulfonic acids and/or indolines is no more than 2 ppm.